Short Communication

Removal of Cr(VI) From Electroplating Industry Effluent via Electrochemical Reduction

Shiyou Li¹, Zhongqing Hu¹, Shuibo Xie¹,², Haiyan Liu¹, Jinxiang Liu¹,*

¹ Hunan Provincial Key Laboratory of Pollution Control and Resources Technology, University of South China, Hengyang, Hunan, 421001, P.R. China.
² Key Discipline Laboratory for National Defence for Biotechnology in Uranium Mining and Hydrometallurgy, University of South China, Hengyang, Hunan, 421001, P.R. China.
*E-mail: liu2000gps@sina.com

doi: 10.20964/2018.01.83

Received: 6 October 2017 / Accepted: 19 November 2017 / Published: 16 December 2017

In the present work, an electrochemical reduction process with iron and titanium electrodes was investigated for hexavalent chromium (Cr(VI)) removal. The removal of Cr(VI) and its resulting species was investigated by measuring the efficiency of the electrochemical reduction treatment. For the Cr(VI) removal, a lower performance was found for the titanium electrode than the iron electrode. Therefore, the resulting Cr(VI) reduction, which occurred through electrochemical reduction using iron electrodes, was chemical reduction by the anodically generated Fe(II). Furthermore, the resulting Cr(III) was efficiently precipitated as Cr(OH)₃ and was rapidly removed from solution.

Keywords: Pollution management; Electrode configuration; Industry Effluent; Electrochemical reduction; Cr(VI) removal

FULL TEXT

© 2018 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (http://creativecommons.org/licenses/by/4.0/).